

AMENDMENTS TO THE CLAIMS

- 5 Claim 1 (Previously presented) An extrusion-free wet cleaning process for post-etch Cu-dual damascene structures, the process comprising:
- 10 providing a wafer comprising a silicon substrate and at least one post-etch Cu-dual damascene structure, the post-etch Cu-dual damascene structure having a via structure exposing a portion of a Cu wiring line electrically connected with an N⁺ diffusion region of the silicon substrate and a trench structure formed on the via structure;
- 15 executing an oxidation step by applying a diluted H₂O₂ solution to the wafer to slightly oxidize the surface of the exposed Cu wiring line; and
- washing away cupric oxide generated in the oxidation step by means of a cupric oxide cleaning solution containing diluted HF, NH₄F or NH₂OH having a pH of above 7.
- 20 Claim 2 (Original) The process of claim 1 wherein the Cu wiring line electrically connected with an N⁺ diffusion region of the silicon substrate serves as a cathode in the cupric oxide cleaning solution.
- 25 Claim 3 (Original) The process of claim 1 wherein the method of preventing Cu reduction reactions on the Cu wiring line comprises purging inert gas onto the wafer during the application to the wafer of the diluted H₂O₂ solution.
- 30 Claim 4 (Original) The process of claim 1 wherein the method of

preventing Cu reduction reactions on the Cu wiring line comprises adding a Cu corrosion inhibitor to the diluted H_2O_2 solution.

- 5 Claim 5 (Original) The process of claim 4 wherein the Cu corrosion inhibitor comprises benzotriazole (BTA).

- 10 Claim 6 (Previously presented) The process of claim 1 wherein the method of preventing Cu reduction reactions on the Cu wiring line comprises reducing the H_2O_2 concentration of the diluted H_2O_2 solution to below 100:1 (v/v) of solvent to H_2O_2 .

- 15 Claim 7 (Original) The process of claim 1 wherein the method of preventing Cu reduction reactions on the Cu wiring line comprises lowering the temperature of the diluted H_2O_2 solution to below $15^\circ C$ during the application to the wafer of the diluted H_2O_2 solution.

- 20 Claims 8-19 (Cancelled)